Indiana Renewable Energy Conference
-Distributed Wind Generation

July 20, 2011

Agenda

- Evaluate
- Make the decision
- Prepare
- Nuts and Bolts of a turbine
- The Install
- Maintain

The Evaluation

- Cursory review of the wind resource
  - Need to determine whether wind is a realistic option based upon the availability of wind (see wind mapping)
- Set expectations
  - Measure your energy demand over the course of a year and decide how much energy you want to offset
    - Factor in the electricity rate to determine annual offset expected
    - Grid backup versus battery backup
    - Determines size of the turbine
- Research the variety of turbines and installers that are available
  - **Considerations:**
    - Vertical vane versus horizontal vane (use NREL as a resource)
    - Space availability
    - Installer qualifications and experience
    - Price
    - Utility policies

Make a decision that fits

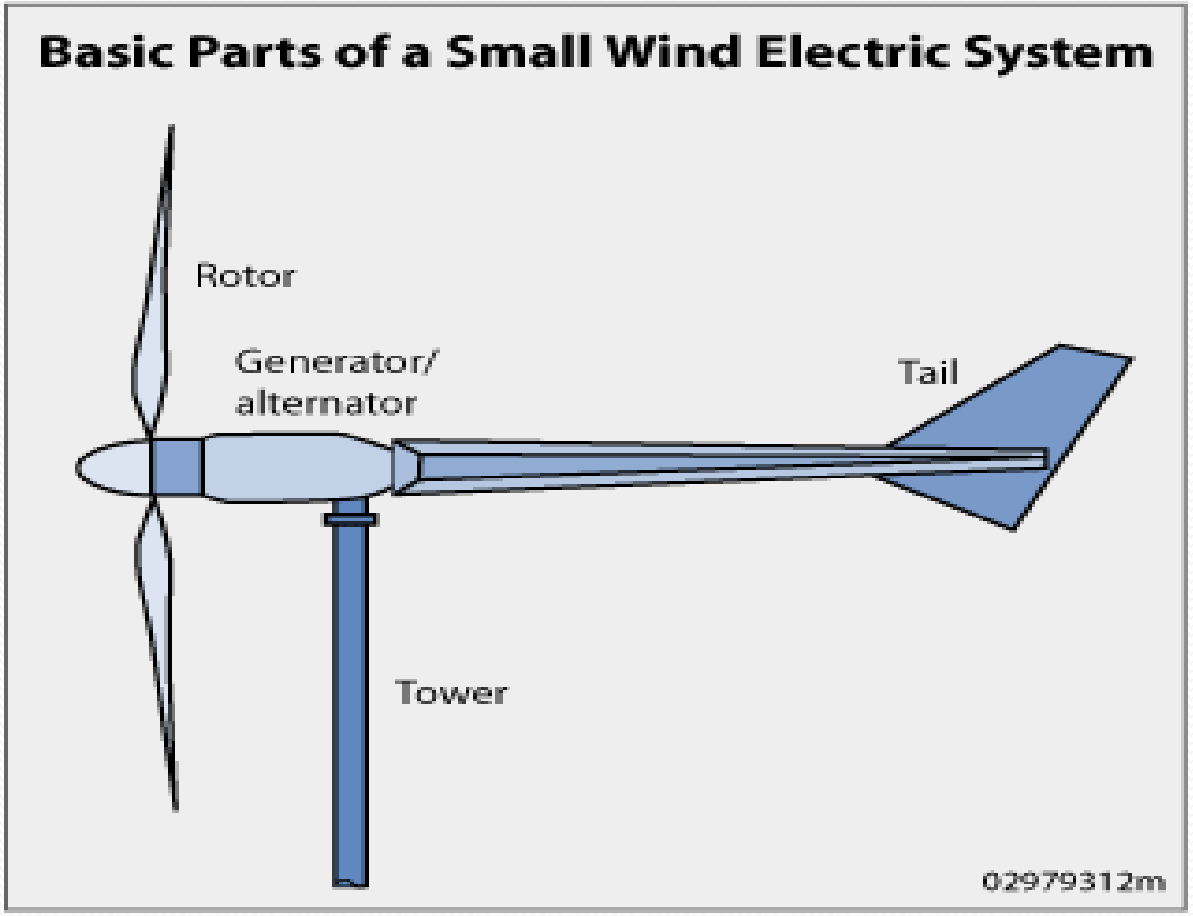
- Based on your evaluation, choose the system that gives you all that you need
- Devise an accurate cost analysis based upon expected system output and projected energy savings
  - Be sure to understand the incentives that bring the decision into focus
    - 30% tax credit that, for businesses, can be taken as a grant in lieu of the credit this year only
    - Accelerated depreciation for businesses
      - 100% of the system, less half the grant, can be depreciated in the first year if the system is completed by year's end
    - USDA REAP Grants (up to 25% of the installed cost)
  - Decision can be dictated by internal utility policies, so engage the utility company early on
    - Net Metering (recently updated)
  - Don't forget to insure

Preparation

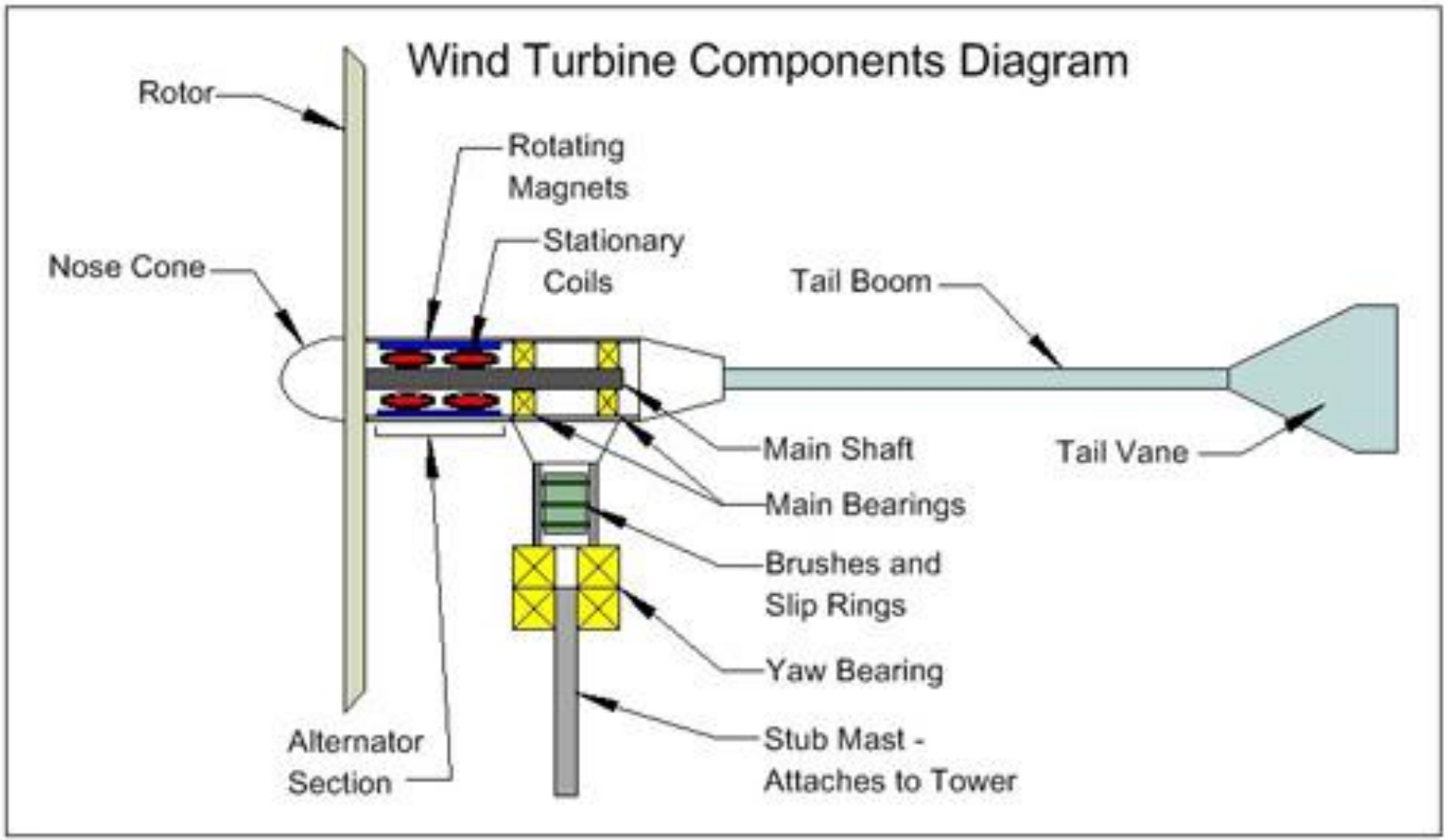
"This is the toothpaste. I asked you for the Preparation H."

- Site investigation
  - Larger distributed wind projects should study the wind resource in more detail
    - Soil study may be needed as well in these cases
  - Engage applicable governments with jurisdiction on the project site to determine potential regulations (variance may be needed if no wind-specific ordinance is in place)
    - Height restrictions, location relative to property boundaries, wetland implications, floodplains, cultural resources disturbed, etc…
- Talk with your neighbors for smooth sailing
  - Find a site that limits the turbines impact on neighbors and your home
- Begin process of interconnection with the utility

Typical turbine design



The Inner Workings



An Install from Start to Finish

- Pour the foundation which stabilizes the turbine via anchor bolts (base size gets larger with taller tower)
- Tower assembly and turbine attachment
- Run wire from turbine through tower to point of interconnect
- Erect turbine using a variety of methods ranging from a self-supporting lattice tower build out to guyed lattice tower pull-up to typical tilt-up to the New Holland/Straeter method
- Commission tower by connecting to electrical panel

Maintenance Requirements

- This is a huge matter and often overlooked or not mentioned
- A five year warranty and a reputable dealer are a must
- If there aren't owners who have data on maintenance you can talk to, be concerned
- Request dealer lock in maintenance costs

Be Realistic

- Renewable energy isn't free and it isn't cheaper than grid power. Too many people talk themselves right into paradise with promises of performance that aren't realized.
- Wind Power at the home level can work, can be a solid (long term) investment on it's own and provide environmental benefits with power!

Thank you!

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